

Single-Process, Unitized, Composite Fuselage, Phase I

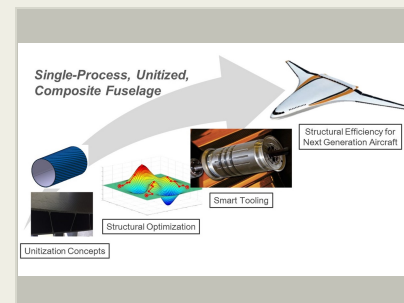
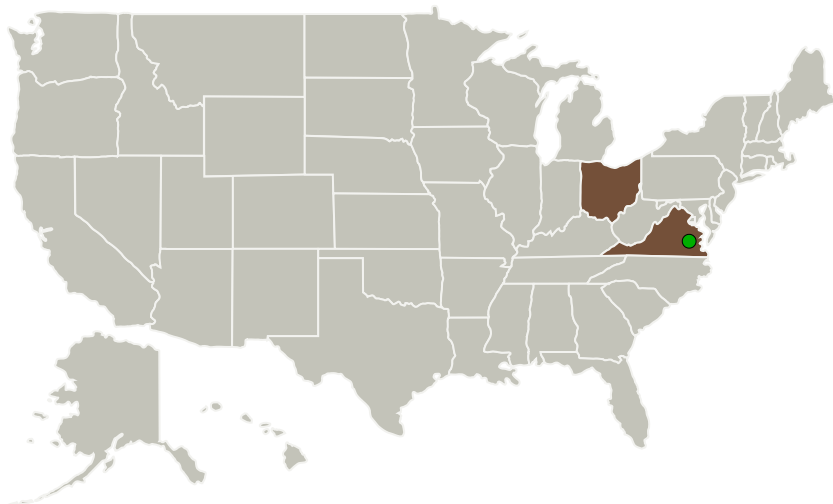
Completed Technology Project (2017 - 2017)



Project Introduction

NASA seeks tailored airframes and structures to reduce structural mass in support of the NASA Aeronautics Strategic Implementation Plan (2015), following the Roadmap for Ultra-Efficient Commercial Vehicles, Subsonic Transport. Tailored structures are comprised of the right materials, at the right place, in the right orientation, in the right amount. Whatever the material or structural configuration, excess weight is driven out through optimization, within the limitations of the manufacturing approach. CRG has been laying the foundation for the design and production of tailored structures for more than a decade. CRG's vision for tailored airframes and structures begins with unitization, enabled by Smart Tooling for affordable manufacturing of complex composites. CRG began work on Smart Tooling for fuselages in 2005, targeting fully-integrated, single-process skins, stringers, and frames. CRG subsidiary Spintech launched in 2010 to commercialize Smart Tooling into the aerospace industry, and soon after demonstrated a quarter-scale unitized fuselage. Today, CRG brings robust capabilities in composite structural optimization, expanding capabilities in aerospace composite fabrication, leading-edge understanding of hybrid nano-composites, and Spintech's Smart Tooling technology to provide NASA with advanced, highly-tailored fuselage configurations with unmatched structural efficiency.

Primary U.S. Work Locations and Key Partners



Single-Process, Unitized, Composite Fuselage, Phase I Briefing Chart Image

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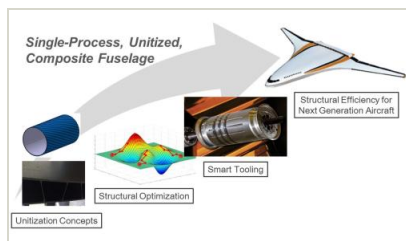


Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Ohio	Virginia
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Images



Briefing Chart Image

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(<https://techport.nasa.gov/image/129117>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

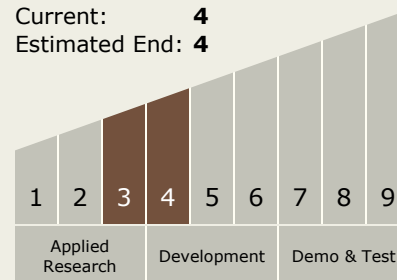
Carlos Torrez

Principal Investigator:

Bryan M Pelley

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes